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ANNUAL REPORT

— OF THE —

BOARD OF

SHEEP COMMISSIONERS

— OF —

MONTANA

1911-1912

T. C. POWER, PRESIDENT
HELENA, MONT.

F. D. MIRACLE, VICE-PRES.
HELENA, MONT.

GEORGE J. JOYCE, SECRETARY
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DR. M. E. KNOWLES,
STATE VETERINARIAN

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STATE PUBLISHING CO., HELENA, MONT





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ANNUAL REPORT

Board of Sheep Commissioners of Montana

1911-1912

To His Excellency, Governor Edwin L. Norris:

As required under the law, we beg to submit herewith, supplementing our annual report for 1911, the report of this commission for the term commencing December 1, 1910, date of last biennial report, and ending December 1, 1912.

Of the appointments made to this board by you in March, 1911, the commissioners for the following counties have not as yet qualified, namely:

Deer Lodge, Fergus, Gallatin, Musselshell, Meagher, and Powell counties, and therefore the above counties are without representation on this board at the date of this report.

We are very glad to report that with the careful supervision of the state veterinarian, and the intelligent co-operation of the different inspectors in the state, and the warm support of the sheepmen generally, we are again able to give the state a clean bill of health.

Scab is practically unknown among Montana flocks, and while we have some tick and an occasional outbreak of lip and leg ulceration, we know at this writing that Montana is freer from sheep disease than any other state in the Union and in better sanitary condition than any other state that we have knowledge of.

In March, 1912, by and with the advice of the state veterinarian, this board requested you to issue a quarantine proclamation against Wyoming sheep on account of the prevalence of scab in that state, which upon our recommendation you did. The action taken by you at that time was very timely, as it has developed since that thousands upon thousands of Wyoming sheep are afflicted with scab at the present time, and there is no telling what the results would have been in Montana had this action not been taken.

For your information we submit herewith a detailed account of the financial transactions of the board from December 1, 1910, to December 1, 1912, audited and vouched for both by the board and the state examiner.

FINANCIAL REPORT.

Balance on hand Dec. 1, 1910.....	\$ 11,169.66	
Inspection charges imp. sheep.....	1,184.50	
Back taxes	1.53	
Taxes 1911	5,000.05	\$17,355.74

EXPENDITURES 1910-1911.

Legal expenses	\$ 700.00
Commissioners	550.90
Insp. and treatment	6,095.30
Postage, printing, etc.	279.22
Secretary, 13 months	975.00
Co. Nat. Wool Growers	600.00
Pd. Dr. Knowles	250.00
State Fair expenses	150.00
Mileage book	675.00
Rent	100.00

Dec. 1, 1910, to Dec. 1, 1911,
total expense \$ 10,375.42

Dec. 1, 1911, to Dec. 1, 1912—

Legal	\$ 199.05
Commissioners	41.90
Insp. and treatment	4,508.95
Postage	14.51
Rent	75.00
Investigation, Starz	25.00
Vet. supplies	35.40
Nat. Wool Growers Ass'n	555.00
Secretary	900.00
Auto hire	15.00
Mileage books	450.00

Total to Dec. 1, 1912..... 6,819.81

Grand total, Dec. 1, 1910, to Dec. 1, 1912 17,195.23

Balance on hand\$ 160.51

Treasurer's balance Dec. 1, 1912.....	\$ 496.46
Outstanding unpaid warrant, Bowman	\$ 319.95
Outstanding unpaid warrant, No. 11406, McQuay	16.00 335.95

Correct balance \$ 160.51 \$ 160.51

At the present writing there are no unappropriated, outstanding claims against this board, with the following exceptions, other than the regular monthly bills:

The outstanding unpaid claims are those of Stranahan & Stranahan, \$138.20; and Geo. W. Farr, \$50.00, aggregating \$188.20, for services performed in the investigation of bounty claims against the state, under and by the direction of the executive committee of this board.

The number of sheep in the state, as reported by the county assessors, for the years 1911 and 1912, is as follows:

	1912.	1911.
Blaine	318,597
Beaverhead	160,216	165,700
Broadwater	47,450	54,176
Carbon	118,876	155,932
Cascade	135,080	147,615
Chouteau	203,336	643,345
Custer	264,577	425,797
Dawson	298,242	340,513
Deer Lodge	5,381	3,276
Fergus	297,217	358,516
Flathead	2,673	2,046
Gallatin	22,841	22,487
Granite	16,840	12,611
Hill	156,981
Jefferson	10,074	4,550
Lewis and Clark	161,091	147,009
Lincoln
Madison	126,767	135,112
Meagher	265,874	250,838
Missoula	3,294	2,835
Musselshell	139,878	176,051
Park	84,733	86,166
Powell	97,821	92,513
Ravalli	17,373	19,913
Rosebud	325,774	306,130
Sanders	26	23
Silver Bow	11,040	13,565
Sweet Grass	276,364	286,657
Teton	248,110	221,245
Valley	203,273	230,993
Yellowstone	292,240	219,330
	<hr/> 4,311,039	<hr/> 4,524,944

The total number of sheep assessed in the state in 1911 was 4,524,944, valued at \$11,360,116.00; and in 1912, 4,311,039, valued at \$9,013,013.00. There were, according to the assessors' report 213,905 less sheep assessed in 1912 than in 1911. This falling off in sheep does not wholly

account for the difference in the sheep assessed between the years 1911 and 1912. The actual falling off in the number of sheep was 213,905, while the value fell off \$2,347,103.00, this difference being made up from the lower assessed value placed on sheep in 1912 than in 1911.

A very fair estimate of the actual number of sheep in this state in 1912 is 5,388,798, and in 1911, 5,655,180; and the estimated wool crop in 1911 about 43,000,000 pounds, and in 1912 about 41,000,000 pounds. This estimate is based on the average weight of fleece at $7\frac{3}{4}$ pounds.

The average price of wool in 1911 was about $18\frac{1}{2}$ cents, and in 1912, about $20\frac{1}{2}$ cents, so that, notwithstanding the falling off in the wool crop of 1912, the revenue to the wool men for all practical purposes was about the same.

BOUNTY.

Although the duties of the board are to a very large extent wholly confined to matters of sanitation in sheep, still we have, since the institution of the board, endeavored to look after all matters of interest for the sheep owners of the state, and in that connection the executive officers of this board have endeavored to keep watch upon the administration of the bounty fund, created by a tax upon the livestock of the state by the last legislature.

During the year 1911 the old claims filed in 1909, under the old law, have all been paid, and there remain now unpaid, under the old law, about \$65,000.00 for 1910, and about \$17,000.00 for the first two months of 1911. Upon investigation we found in April, 1912, that the total bounty claims, filed under the new law, for only three months were \$43,527.00, or upon an average of over \$14,000.00 a month; while the total claims, filed under the old law for 1911 amounted to \$105,053.00, or an average of about \$10,000 per month. The executive committee of this board took up the proposition of engaging the services of several attorneys in the principal bounty counties in the state to act in conjunction with the county clerks to the end that all bounty claims be carefully watched and that all apparent bounty frauds be carefully investigated.

This board took up the proposition and appointed several attorneys with the understanding that the investigation be continued until the end of 1912, and with the further understanding that the board of stock commissioners would join with this board in sharing the expense, which was not to exceed \$150 to each attorney for the whole time mentioned, excepting that in the case of arrest and conviction for bounty frauds reasonable additional compensation was to be allowed. In June, 1912, it was found that the action of this board in keeping careful watch of bounty claims had reduced the monthly average of claims filed from about \$14,500 per month to about \$12,000 per month. It was estimated that if the average of the first three months of the year was continued that there would be a deficit of some \$50,000 in the fund, as the estimated revenue from taxation was only about \$122,000.

The investigation of the board was bearing fruit, but as the stock commission had not the funds it did not care to help out in the matter and the arrangement above referred to with the different attorneys was called off.

On December 1, 1912, there had been filed for the year, under the new law, claims aggregating \$123,335.00, with every probability that before the first of the year the claims would amount to about \$130,000.

These bounty claims are a matter of great importance to the sheep industry of this state, and something should be done to the end that predatory wild animals be wiped out in the state and not allowed to increase as they are doing at the present time.

The one bad condition in this matter is that in Canada and in the states bordering upon Montana little or no bounties are paid, and it is a well known fact that thousands of animals killed in Canada and our bordering states are brought into Montana and the scalps used to secure the higher bounty paid here.

All bounty inspectors should be men trustworthy and experienced, and should be appointed through and with the advice of the sheep and stock commissioners in order that some supervision of their official acts could be had.

From our investigation we find that there has been a great laxity in carrying out the provisions of the law, notably that part of the law which states that all affidavits covering claims must be made, not by the party presenting the hides, but by the party actually killing the animal for which the claim is being made. In numerous instances this part of the law has been overlooked and claims filed, not by parties killing the animals but by parties who make it a business of buying up these pelts.

Along these lines, for your information, we beg to attach the following correspondence from two different attorneys who are acting with this board in an endeavor to investigate the matter:

THOMAS DIGNAN,
Attorney at Law,
Glasgow, Montana.

December 2, 1912.

Hon. T. C. Power, Helena, Montana.

Dear Sir: A short time ago, while on the train to Chinook, Montana, you requested me to write you in regard to the operation of the bounty law in this county. I find that the cattle and sheep men do not take any interest in the enforcement of this law. I believe that some means should be used to call their attention to the strict enforcement of the law and secure their assistance. The first place I find that no interest is taken whatever to secure good inspectors. The inspectors in this county at the present are James A. Battram, Malta; C. W. Nelson, Saco; R. R. Davis, Hinsdale; Julius Listoe, Glasgow; James Deegam, Frazier; S. T. Cogswell, Wolf Point; S. P. West, Culbertson; and A. R. Chapman, Plentywood. Not one of these parties can be termed a cattle or sheepman. All work or are interested in general stores, except Chapman, who is a U. S. commissioner, and Listoe, who is the janitor at the court house. I understand that some of the inspectors buy the hides after they are inspected. About the only thing that they do is to punch all hides that are presented to them and issue the certificates. I called one inspector's attention to the provision of the law, that required the party who killed the animal to furnish the proof of the killing of the animal. He was of the opinion that that did not make any difference and did not pay any attention to that whatever. By this ignorance or indifference of the inspectors it gives every chance to bring in hides from Canada or North Dakota. A

large number of breeds on the Fort Peck Reservation hunt coyotes on the reservation and even in Canada.

It appears to me that more care should be used in the selecting of the inspectors. A stock man should be appointed and one who is not afraid to make a thorough investigation whenever it was necessary. I am satisfied that we are paying bounty on a large number of animals that never were killed in this county.

Yours very truly,

(Signed) THOMAS DIGNAN.

Law Offices
George W. Farr,
Attorney and Counsellor at Law,
Miles City, Mont.

H. E. Herrick,
Lawyer.

May Eighth,
Nineteen Twelve.

Honorable Thomas C. Powers, Helena, Montana.

Dear Sir: I have made examinations of the bounty records in the county clerk's office here covering a considerable period, and while I cannot find out much from the records themselves still it does appear as if there are some parties who are bringing in more hides than they should, for instance there is a party by the name of J. Block, who each month brings in a large number of hides and I know that he is not killing any animals himself; he is undoubtedly buying the hides from the ranchers, he being kind of a junk collector going around the country buying old iron, copper, etc., and he probably collects these hides as he goes around. As I understand the law, however, it provides that the person who actually killed the animal is the one who must present the hides and make the affidavits. Now these affidavits are all made by this man Block. It opens up a wide field for fraud. I am inclined to believe that there is a great deal of this; that is to say that there are lots of hides that are brought in by people who buy them from others and then present them as their own. This should be stopped, and some one should be made an example of in this regard. When they make an affidavit of this kind to hides which they do not themselves take from animals which they have themselves killed, they swear falsely and commit perjury. I think this man Block will bear watching and I am going to see that he is watched closely.

Yours truly,

GWF/FH

(Signed) GEO. W. FARR.

For the information of yourself and all concerned we beg to submit a table, showing a comparison of the bounty claims filed in 1911 and 1912:

COMPARISON OF BOUNTY CLAIMS, 1911-1912.

Counties—	1911	Apl. 8, '12.	June 14, '12	Dec. 1, '12
Beaverhead	\$ 4,994.00	\$ 4,286.00	\$ 5,555.00	\$ 7,136.00
Broadwater	763.00	556.00	832.00	1,162.00
Blaine	-----	-----	-----	3,327.00
Carbon	1,879.00	681.00	1,314.00	1,923.00
Cascade	2,495.00	1,162.00	2,102.00	3,528.00
Chouteau	14,535.00	2,583.00	4,036.00	6,894.00
Custer	15,842.00	2,501.00	8,259.00	15,703.00
Dawson	5,292.00	2,303.00	4,034.00	7,540.00
Deer Lodge	171.00	120.00	264.00	318.00
Fergus	6,729.00	1,837.00	3,479.00	5,951.00
Flathead	1,634.00	626.00	2,288.00	3,346.00
Gallatin	1,864.00	808.00	1,534.00	2,347.00
Granite	775.00	501.00	675.00	891.00
Hill	-----	-----	519.00	1,833.00
Jefferson	693.00	612.00	690.00	816.00
Lewis and Clark..	3,199.00	822.00	1,863.00	3,559.00
Lincoln	558.00	563.00	935.00	2,010.00
Madison	1,794.00	1,284.00	1,599.00	2,112.00
Meagher	2,305.00	1,488.00	1,977.00	2,709.00
Missoula	1,206.00	259.00	421.00	997.00
Musselshell	1,209.00	1,371.00	1,839.00	4,377.00
Park	2,509.00	2,804.00	4,535.00	5,872.00
Powell	1,126.00	1,125.00	1,800.00	2,124.00
Rosebud	7,207.00	3,370.00	5,585.00	7,112.00
Ravalli	486.00	849.00	963.00	1,116.00
Sanders	391.00	136.00	196.00	325.00
Silver Bow	689.00	577.00	673.00	853.00
Sweet Grass	1,773.00	1,356.00	1,488.00	2,041.00
Teton	7,323.00	381.00	1,335.00	7,770.00
Valley	10,682.00	2,280.00	4,470.00	11,416.00
Yellowstone	4,930.00	3,316.00	4,753.00	6,267.00
Totals	\$105,053.00	\$ 43,527.00	\$ 70,013.00	\$133,335.00
Average amount for 10 months, 1911.....	\$10,505.30			
Average amount for 3 months, 1912.....	14,509.00			
Average amount for 6 months, 1912.....	11,668.00			
Average amount for 11 months, 1912.....	11,212.27			

The amount of taxes collected for the credit of the bounty fund from 1911 taxes was only \$116,823.98, and the estimated revenue from this source for 1912 is about \$120,000.00, and as the claims that will be filed for 1912 will amount to about \$130,000.00 it can be easily seen that there will be a large deficit in coming years if this bounty claim fund is not carefully supervised and investigated.

We are of the opinion that the investigation conducted by the sheep commission kept the claims for 1912 down considerably, and that they can be further reduced by proper supervision.

As a part of our report we beg to submit herewith the report of Dr. M. E. Knowles, state veterinarian, submitted to this board under date of November 30th, 1912, and his supplemental report to this commission on coyote and wolf mange infection, submitted at our request, before the meeting December 17, 1912:

Helena, Montana, November 30, 1912.

To the Honorable Sheep Commission, Helena Montana.

Gentlemen: It is with profound gratification I am enabled to report the most salutary condition regarding health of sheep in our great commonwealth that has existed during my incumbency. There is not a single case of scab among sheep in the broad state of Montana; nor has there been during the past three years; this freedom from scab and other diseases being due to rigid enforcement of our splendid sanitary law. The example presented is most convincing evidence of necessity for strict maintenance of such laws, and their equally strict enforcement. The advent of "dry land" farmers, gratifying example of rapid influx of new settlers, has created a profound revolution in Montana's sheep husbandry, which presages a rapid change from large range herds to smaller holdings under strict agricultural conditions.

The subjoined table fully demonstrates the magnitude of work accomplished during the past two years. While it does not show in aggregate a greater number of inspections made during former years; equally as much or more has been accomplished, it requiring a far greater travel to reach a far less number of sheep.

LIP AND LEG ULCERATION.

Lip and leg ulceration, to which your attention has been called during the past ten years, is still existing to a more or less extent. All those who have had experience in its treatment, and who, conscientiously and religiously, employed practical methods (applying nitric acid treatment as it should be), have completely eradicated the disease from their herds. Substantially, all calls regarding this disease during the past two years have been from those who have not had experience with the disease. It is conclusively proven that nitric acid treatment, intelligently employed, is, practically, a specific for the disease; and, where negotiated as it should be, the malady is rapidly repressed and does not again appear. We have made a number of investigations relative to prophylactic measures against this malady, hoping, ultimately, some form of anti-toxin may be found which will be as thorough a preventive of the malady, as diphtheria anti-toxin is in human medicine, or blackleg vaccine among cattle.

PARASITES OF SHEEP.

In accord with instructions from the board, jointly with your honored president, I employed Dr. A. D. Knowles to make as thorough a survey of internal parasites of sheep as could be done under existing conditions. His very clear, intelligent and conservative report is herewith submitted, which, I trust will be read attentively and carefully by each member of the board:

“Livingston, Montana, November 11, 1912.

Dr. M. E. Knowles, State Veterinarian, Helena, Montana.

Dear Sir: I beg to submit to you my report of the investigation, treatment and final results of the A. A. Lamp sheep, which was begun October 20, 1911.

There were 165 grade Delaine lambs, mixed bucks and ewes, which showed the following symptoms:

Spasmodic bronchial cough; muco-hemorrhagic nasal discharges; wool dry, harsh and staring; skin white (paper skin); appetite poor; backs arched and generally stupid and listless.

History: About March, 1911, two hundred ewes were purchased from Mr. L. C. Bady, of Big Timber. These sheep had been kept the previous year on a ranch one mile northwest of Big Timber, on low land along the Yellowstone river. The lambs came in March, and ran with the ewes until September on the Lamp ranch, which consists of one hundred acres of alfalfa, which is irrigated, and about two hundred acres of unirrigated grass land. The ewes were shipped to market October 1, 1911. The owner* did not notice anything wrong with the ewes, but noticed that the lambs coughed a good deal, beginning in July, which has increased in severity.

October 20, 1911. Post-mortems: Lamb No. 1, weight seventy pounds. Subcutaneous tissue is pale and the blood thin, pale, and slow to coagulate. Liver and kidneys showed fatty degeneration; trachea and bronchi contained a quantity of mucous in which were found a number of thread worms of the variety *strongylus-fallaria*. The cranial cavity and head sinus contained no worms, nor were there any in the intestines or liver.

October 20, 1911. Post-mortem: Lamb No. 2, weight fifty pounds. Same pathological conditions as lamb No. 1, except that there was a small abscess on one lung which contained only puss.

Lamb No. 3. Same date; same as No. 1, except that apices of both lungs were hepatized.

In each of these post-mortems, the *strongylus-filaria* were the only parasites found. The lambs were given drenches of turpentine emulsion on October 23d, and repeated in three days; and once a week thereafter. They were kept in the same corral, and allowed to run into a shed adjacent, which they had been using for two or three weeks, after which they were turned to pasture, which was the same alfalfa they had run on during the summer. The corral and shed were cleaned and air slacked lime scattered over the ground. During stormy weather, the lambs were allowed to run in the corral and shed. The feed consisted of alfalfa hay in feeders while in the corrals and on the ground when in the field. The sheep were watered in troughs by a well, and were cleaned and disinfected once a week. It was impossible to keep them away from the corral and shed, and they were allowed to use them during bad weather all winter.

Nov. 7, 1911. Lamb No. 4. Post-mortem: Weight sixty pounds. This lamb showed cough, dry wool and 'paper' skin; and the autopsy showed hepatized spots in both lungs, but no worms were found. The balance of the flock appear better in every way, except that they are coughing a good deal; but there is not as much blood-stained mucous as formerly adhering to their nostrils.

Nov. 14. 1911. The sheep appear much improved; still coughing, but not so distressingly; no bloody nasal discharges, and but little mucous. Wool looks oily; skin shows color; they are all eating good, are lively, and the bucks are beginning to ride.

December 19, 1911. Sheep all look healthy, and there is no evidence of disease among them, except that there is some coughing, but it is of slight character and does not distress them. The turpentine was now discontinued and no further treatment given. I did not see the sheep, but Mr. Lamp reported to me occasionally, and they were kept under the same conditions until March, 1912, when they were sold to be shipped to market, but the bucks were afterward re-sold to a local breeder and added to a larger number of bucks. Twenty-five of the band were kept by Mr. Lamp, and ran on the same range up to the present time, and he says they seem healthy and have done well. Of the bucks that were sold to local breeder, no symptoms of the disease have appeared among them.

During the latter part of last winter, Mr. Lamp reported that two lambs were slaughtered for mutton, and he found worms in the bronchi of both. A band of one thousand lambs were put on feed by Mr. Lamp on October 1, 1911, and, about December 1, 1911, they were allowed to use part of the shed originally used by the infected sheep, but with the exception that they were not exposed to the infected sheep or premises. The fat sheep were sold to the market about March 1, 1912, and never showed any symptoms of the disease.

I wish to supplement this report with a report of a band of 1,350 sheep, of which 950 were in the Gallatin Valley and 400 were taken in Sweet Grass county in the spring of 1909. Upon my first visit to the Sweet Grass bunch, there were a number which had recently died upon which I held several post-mortems, and found them badly infected with lung worm, and, some of them, also, infested with tapeworm and other varieties of intestinal worms. Practically all of the Sweet Grass bunch showed symptoms of parasitic infestation. A few days thereafter, upon visiting the Gallatin valley bunch, post-mortem revealed the lung worm and the symptoms were evident in about ten per cent of that bunch. All of these two bunches of sheep were placed upon the turpentine emulsion treatment, and followed out along the lines just indicated in the A. A. Lamp sheep. The treatment of these two bunches of sheep was begun about the latter part of May, and continued for eight weeks. After four weeks time, the sheep were removed to uninfested pasture, and, at the end of eight weeks, there were no evidences of internal parasites, excepting some bronchial coughing.

About October, the buck lambs were sold from the Gallatin valley bunch and used for breeding that winter; some of the ewes were sold and shipped to different parts of the state. The Sweet Grass bunch changed ownership and I had frequent opportunities to see them for the following two years. The Gallatin valley bunch were run in the same neighborhood, but on different range for two years, when they changed ownership and were taken to another county. The buck lambs have been sold from all these sheep each fall since, and have shown no symptoms of parasitic infection. All of the above sheep are healthy at this date.

I will, here, give a partial life history of the strongylus parasite, as given to us by our authors. The young worm, or embryo, is ingested by the mouth with the feed or drinking water; the bowel form attaches itself to the mucous membrane of the true stomach, or small intestine; while the lung form circulates through the blood and lodges in the bronchi, or small air cells, where it attaches itself to the mucous lining. These parasites live by sucking the blood of their host, and are matured in fourteen days. The eggs are laid in the host, and are expelled either by coughing or by the bowels; and, if they fall in moist earth, they will hatch in from five to ten days. If the eggs fall on dry ground, they may lay dormant for an indefinite period, and, if sufficient moisture falls to favor their hatching and the field again becomes dry, they will perish. Young embryo moult twice a few days apart, and, after the second moulting they are capable of withstanding great severities of weather.

Conclusions: The conclusion I have arrived at is that sheep infested with the strongylus parasite may be kept on infested ground with very slight losses, if drenched weekly with turpentine emulsion; or, they may be treated for a time with turpentine emulsion, and then removed to non-infested grounds and thereby cured of the parasite; or, if they are moved every two weeks to fresh non-infested pastures, if well nourished, my opinion is they will finally get rid of the infestation without treatment. My recommendation for the handling of a badly infested bunch of sheep would be to drench each sheep with turpentine emulsion once a week until all symptoms of the infection have disappeared; and, if possible, to change them to fresh pastures every two weeks. If the sheep are poor in flesh, I would recommend, in addition to good nourishing food, a course of tonics to be continued until such time as they are in a thrifty condition.

Respectfully yours,

A. D. KNOWLES,

Deputy State Veterinarian."

This subject is of most vital importance to the sheep industry of Montana, presenting a problem that is of extraordinary difficulty in solution. I respectfully recommend, during the coming year, a specialist be employed to make investigations along lines heretofore indicated; with the addition that a complete survey be made of this state, so we may have accurate data as to the existence of various internal parasites in the different localities of our state. Since scab has been thoroughly eradicated, the serious problem now presented is continued existence of a limited amount of lip and leg ulceration and internal parasites above mentioned.

FRINGED TAPEWORM.

Serious losses have occurred in a few localities during the past two years from the fringed tapeworm, which has been repeatedly called to your attention covering a number of years. So far, there is no specific treatment for this worm; although powdered tobacco, added to heavy feeding with crushed grain, gives very good results in infected herds, and should be employed by all sheepmen having herds suffering from this malady.

GID.

So-called "Gid," or the larval form of dog tapeworm, is still existing in some herds throughout the state where the dogs are not properly treated.

However, those sheepmen, having flocks suffering from the malady, who have conscientiously and religiously treated their dogs, have practically eradicated this internal parasite from their flocks.

DIPPING.

I desire to call your attention to the importance of annual or semi-annual dipping of all sheep in the state for ticks. Experience has proven the unqualified benefit, value and profit of this procedure. These sheepmen who conscientiously dip sheep annually for ticks and lice more than doubly pay for trouble and expense in increase of carcass and fleece. It would seem, in the face of this unquestioned fact, that our flock masters would, therefore, agree, without legal compulsion, and resort to this more than valuable expedient, which would redound so materially to their gain financially, as well as from a health view.

RECOMMENDATIONS.

There is so little of real interest, save statistical matter herewith submitted, that it is quite difficult indeed to make a report of unusual interest. I beg to recommend, again, issuance of a dipping order by the board for the purpose of cleaning our sheep of ticks and lice throughout the state; also, to insistently recommend the employment of an expert for the purpose of studying internal parasites of our sheep; and, for the furtherance of our sheep industry, beg to suggest employment of an expert to lecture at various farmers' institutes throughout the state, on sheep, sheep breeding; particularly, the production of mutton and wool, which would be of inestimable value to our sheep industry and redound to the credit of the commission.

Again expressing gratification at the remarkable freeness of Montana's sheep from disease and the prosperous condition of the sheep industry at the present date, this report is

Respectfully submitted,
(Signed) M. E. KNOWLES,
State Veterinarian.

MEK-M

SHEEP.

	1911	Bucks	Mixed
Imported sheep dipped and quarantined.....	1,588		35,634
Buck herds inspected	18,236		
Examined and treated for lip and leg ulcer.....			12,000
Examined and found free from disease.....	1,500		128,514
		<hr/>	<hr/>
		21,364	176,148
		<hr/>	<hr/>
Public buck herd permits issued			27
Number cars disinfected			305
	1912	Bucks	Mixed
Imported sheep dipped and quarantined.....	3,291		
Buck herds inspected	9,458		
Examined and treated for lip and leg ulcer.....	3,417		112,100

Examined and found free from disease.....	4,289	158,196
	<hr/>	<hr/>
	20,455	270,296
	<hr/>	<hr/>
Public buck herd permits issued.....		16
Cars disinfected.....		360

SUPPLEMENTARY REPORT ON COYOTE AND WOLF MANGE INFECTION.

Helena, Montana, December 17, 1912.

To the Honorable Sheep Commission, Helena, Montana.

Gentlemen: By your special request, beg to make the following brief report regarding the infection of wolves and coyotes with sarcoptic mange of the dog.

Most of you all recollect the legislature of 1908 made an appropriation of fifteen hundred dollars, for the purpose of conducting experimental inoculation of wolves and coyotes with sarcoptic mange of the dog for the purpose of their extermination. This work was placed in charge of my department. At the earliest possible moment, a number of young wolves and coyotes were secured, inoculated with sarcoptic mange of the dog. After being thoroughly inoculated, were subsequently distributed in six different localities of the state; six wolves and six coyotes, thoroughly inoculated, were turned out in southern Rosebud county; a similar number in Teton; also, Chouteau, Dawson and Valley counties.

Where different interest was taken by local stockmen, splendid results have obtained, and particularly so in Rosebud, Custer and Dawson counties. Encouraging reports of the results of these inoculations have been coming in directly to my office during the past three years, particularly from the two last named counties. These reports emanate from citizens of repute and intelligence. Honorable Frank O'Neil, of Custer county, sheep commissioner, who has given much attention to this matter, conservatively estimates that the results in his county obtained by this inoculation; taking into account the number already dead, those infected, and those yet to be infected by the disease; in bounty alone has saved the state half a million dollars. Conceding that this estimate is ten times greater than the actual results obtained, the fifteen hundred dollars expended in the original experiment has more than returned to the state many fold.

The results of this inoculation, beyond preadventure, are so encouraging and fact laden that I am justified in recommending, most urgently, to your board, the setting aside of, if possible, from six to eight thousand dollars especially for the continuance of this work. If it is found feasible to so do; or, in the event of its not being possible, than that the legislature may be induced to set aside or appropriate this amount of money for the furtherance of this expedient. There is no question of doubt but that it will save the stockmen of this state hundreds of thousands of dollars, providing the work is properly and consistently accomplished.

In addition to the state's efforts in this regard, I beg to suggest that the commission pass a resolution requesting the federal government to look into this matter carefully, and, if the facts are as herein stated, to make extensive experiment along the lines first followed by our state; with the suggestion, should

they negotiate the problem, that the preferable and better method in producing inoculation would be to secure aged wolves and coyotes, inoculate them properly, and turn loose at as early time as infection shows upon them; for the reason that when young coyotes are kept for some considerable time about habitation, they do not subsequently cover the broad territory that the older coyotes and wolves do. In addition to this, the females should be spayed so they will not procreate, the same time will rut continuously, and induce the infection of a greater number of males than they would otherwise, thus spreading the infection.

Of course, naturally, the federal authorities would be supposed to conduct their experiment in public parks and upon domain controlled by them, such as Yellowstone National Park, the Indian reservations, and so forth.

In conclusion, I beg to impress upon you the fact the evidence from reputable stock growers of the state is so convincing and so conclusive, that the expenditure of any reasonable amount of money in the perpetuation of this so-called "experiment" will be more than justified.

Respectfully submitted,

(Signed) M. E. KNOWLES,

State Veterinarian.

MEK-M

We further beg to state that at the regular annual meeting of this board, held December 17 and 18, 1912, the following matters, which might prove of interest to the administration, were gone into; and further state that all actions taken by the executive committee of the board, during the recess of the board, were fully ratified and approved. The financial report of the secretary was audited and found correct by a committee appointed for that purpose. An exhaustive report in reference to the matter of branding sheep, the necessity of reporting stray sheep, and recommendations in regard to the importation of bucks, for the information of all concerned, is attached hereto, and the recommendations fully concurred in and approved of by this board:

Helena, Montana, December 17, 1912.

To the Honorable Board of Sheep Commissioners for the State of Montana:

Your committee, appointed at the last meeting of your board, held July 11th, A. D. 1911, for the purpose of considering the more thorough protection of the individual sheep owners of the state of Montana, more especially in matters of information, leading to the legal identification of sheep and the notification and regaining possession of such sheep as may inadvertently or otherwise become lost out of their own band and be picked up and become mixed with those of other herds, owned by other individuals—beg leave to report as follows:

In taking up these matters it was considered desirable to look up the laws of other sheep raising states that we might profit by what had been already accomplished along these lines by them.

The laws of the states of Idaho, Wyoming and Utah were chosen for this purpose. Data from this source, however, were not easily obtainable, as these states had never published their sheep laws in pamphlet form, and we were referred to the Codes and session laws for the information needed. Unfortunately, no one of the members of your committee has lived where copies of these

Codes and session laws were included in their home libraries, and thus it has been they have only been able to see them during yesterday in the law library of the Capitol.

Of these three states Idaho is the only one of them that specifically covers by law the identification of sheep and notification of the owner when found in bands owned by others. The Idaho system includes a general state record being kept, together with a county record, of marks and brands made up from it; the additional brands as recorded being furnished the county recorder from the state record quarterly, which thus keeps the county records up to date.

In this law:

In all rights of title or possession the brand, ear mark, or ear tag shall be prima facie evidence as belonging to owner recording it.

Parole evidence is inadmissible. No person shall change, conceal, deface, disfigure or obliterate any former brand or mark, or brand over such mark.

No person shall cut to a point or cut off or remove more than one-half of one ear of any head of livestock.

The violation of which law is made a misdemeanor.

This Idaho law was fully set forth in their Codes of the year 1908, and more specifically amended and extended in the Idaho Session Laws of 1911, from which we take it they fully recognized the law as practical and necessary, and one which they have found by experience as the best means, and practically the only means of legal identification.

In the matter of strange sheep being found in a band, the Idaho law requires a notice being sent, which notice includes an estimate of the number, and a description of the brands and marks within five days from their discovery, if by a herder, to the camp-tender, foreman or owner, who in turn must within the succeeding five days notify the county recorder whose duty it then becomes to identify the recorded marks and brands from the county record, and immediately notify the owner of such sheep. Possession of such strange sheep for a period of ten days without having given the notice shall be prima facie evidence of guilt under this statute as against herder, camp-tender, foreman or owner, and its violation is made grand larceny. This act was approved March 10th of last year by the Idaho legislature, and it seems adequate for the purpose.

And now, a word in general in regard to the work expected of inspectors which should in nowise be regarded as a criticism of what has been done but as something of possible benefit to be carefully kept in mind.

And it would seem far better that any bucks to be used upon native sheep should be required to be shipped into Montana sufficiently early to permit of their dipping and quarantine of 90 days, to occur before they are needed for use; thus there would be no necessity of a quarantine of large areas of public land for a band of ewes during the breeding season, which range in many cases is needed and otherwise would be used by several sheep owners rather than to confine the quarantined area to the sole advantage of one.

Great care should be used in the selection of quarantine areas, their extent and situation, confining them, if possible, to ranges and reserves set aside for that individual's own use, that they may not affect the pasturage to which others are equally entitled.

There are many matters of considerable moment which seem more or less worthy of mention, such as the:

Wanton mixing of bands upon the open range where one herder wilfully drives his sheep into another band in spite of efforts to keep them out.

The herding in such a loose way as to lose control of a band when nearby herds find it impossible to avoid picking up portions of the other bands, often causing damage and great inconvenience to return them.

The responsibilities of herders for wilful neglect.

The fixing a time for the cutting out of sheep found in the band of another.

The driving of bands containing stray sheep off the ranges belonging to the stray sheep.

The necessity for using the nearest corrals for the cutting out of stray sheep; etc., etc.

It is not expected that all matters pertaining to the rights of individual owners have been mentioned, nor what has been said upon those points touched upon, cannot be improved upon by discussion and suggestion, but it is intended and it is hoped they will prove sufficient to show the necessity for a more thorough and comprehensive system of laws which will be specific in their nature to the end that protection to the individual stock grower, as well as the general interest of the industry, may be more easily and quickly afforded.

(Signed) JOHN DAVIDSON,
WALTER J. CROMWELL,
Chrmn. Com.

The above report was fully concurred in by the board and it was ordered that the recommendations therein contained be carried out as far as possible, and it was the sense of the meeting that the law in reference to imported bucks be strictly carried out.

Referring to the supplementary report of Dr. M. E. Knowles, on coyote and wolf mange infection, beg to state it is ordered that copies of this report, together with the set of resolutions, be forwarded by the secretary to the chief forester of the United States, to the commissioner of Indian affairs, and to the chief forester at Missoula, Montana, with the request that this important matter be taken up by the government officials and that like experiments be entered into by the government authorities, as well as those to be undertaken by this board.

It was further unanimously voted that this board set aside the sum of \$5,000.00 from the unused portion of our 1911-12 appropriation, to be used according to the recommendations laid down in this report; that said sum be expended, or as much thereof as may be necessary, under the direction of the executive committee of this board, and by and with the approval of the state board of examiners.

The committee appointed to take action upon the report of Dr. M. E. Knowles and the bounty question, heretofore called to your notice, reported the following recommendations and resolutions which were unanimously concurred in:

Your committee has considered the report of the state veterinarian and wish to say that we are gratified at the very satisfactory results achieved in the complete eradication of scab from our state, and the regulation and re-

pression of other maladies, so that evil results therefrom are reduced to a minimum; all of which bears testimony to the eminent ability, untiring industry, unflagging interest, and fidelity of Dr. Knowles.

We are in hearty sympathy with the recommendations contained in the report, looking to more universal dipping of sheep for ticks and lice, more careful investigation regarding internal parasites and other diseases that menace the sheep industry, and favor action in this direction as soon as funds are available for this purpose.

In view of the fact that our state has paid out nearly a quarter of a million dollars for bounties on wild animals during the two years now closing, and inasmuch as there is a great temptation to fraud in the bringing in the skins of the animals from adjacent states where there is no bounty, or where it is very insignificant;

Resolved, That we urge the greatest vigilance possible in the protection of this fund and hereby empower the executive committee of this board to employ counsel to prosecute fraudulent claimants and take such other measures as it may deem advisable for the suppression of this evil.

In conclusion we offer for your adoption the following preamble and resolutions:

Whereas, Dr. M. E. Knowles, our state veterinarian, has shown eminent ability and great fidelity in the discharge of his duties so that under his administration scab among our flocks has been completely eliminated, and other diseases of livestock have been reduced to a minimum, so far as losses from them are concerned; and he is deeply interested in and intimately familiar with all the work of this department, and

Whereas, A change in this office would involve much delay on the part of the new occupant in becoming familiar with the work of the department;

Resolved, That Dr. Knowles has our hearty thanks for and unqualified endorsement in the arduous work he has performed and we earnestly urge his reappointment by the governor to this responsible position for another term.

(Signed) FRANK D. O'NEIL,
E. J. STANLEY,
Committee.

There were a number of other resolutions and recommendations which will be given in detail in our regular printed report, which will be ready about the first of the year. It was found to be the sense of this meeting that we request your approval of appropriation for the support of the sheep inspection and indemnity funds, the same as was appropriated in the 1911 legislature. The work accomplished by this board speaks for itself. The very careful administration of the fund under the control of this board has placed us in a position wherein the recommendations made by this board, for the use of certain sums of money for certain purposes that would revert directly to the interests of the sheep industry of this state can well be used for those purposes without in any way interfering with the sanitary and other conditions under the direct control of this board.

Respectfully submitted,
STATE BOARD OF SHEEP COMMISSIONERS.
By GEO. J. JOYCE, Secretary.

(Reprinted for Information of Sheepmen).

Helena, Mont., December 15, 1910.

To the Honorable Sheep Commission:

Numberless inquiries come to this department in regard to a disease among lambs and yearlings commonly called Gid.

I beg therefore on this account to submit the following description of this disease for the benefit of our sheep men, expressing the hope that they will follow the suggestions given to at least aid in the repression of this disease.

Respectfully submitted.

M. E. KNOWLES,
State Veterinarian.

GID, OR STAGGERS.

Taenia Coenurus (Kuch).

The disease which is popularly known as gid, sturdy, staggers, or turnsic in sheep, is caused by the presence of a parasite living in the brain. This parasite is closely related to *Taenia marginata*. It lives in about the same way, but differs from it in detail. It is known as *Taenia coenurus* in its adult state, and as *Coenurus cerebralis* in its cystic state—the stage in which it infects sheep.

Method of Infection.—Sheep become infected with this dangerous parasite while pasturing or drinking where dogs have scattered the eggs in their wanderings through the country. In the west the eggs may also be scattered by wolves, coyotes, and foxes, which may harbor the adult parasite.

Life History.—The eggs of *Taenia coenurus*, after being taken with the food or drink, are hatched within the stomach of the sheep, and make their way through its walls. They then migrate either actively, by forcing their way through the connective tissues, or passively, as is generally believed to be the case, by getting into the circulatory system, and are carried from thence into various portions of the body. Those arriving in the spinal canal and cranial cavity seem to thrive and grow, while the others, which may have reached the heart, lungs, and diaphragm grow for a time and then perish.

Description of Cystic Stage.—Having arrived in the brain cavity, the young embryo migrates upon the surface of the brain much as the embryo of *Taenia marginata* does through the liver substance. The galleries it makes are sinuous. They begin at a point and slowly increase with the growth of the parasite and run in any direction. In from two to three months after the first invasion of the brain the cysts have grown as large as a hazel nut, or about a half-inch in diameter. When examined closely they will be found encased in a thick outer skin, a sac made by the membranes of the brain. Out of these sacs the parasites may be loosened, and these resemble the cystic of *Taenia marginata*. It differs, however, in a very important particular—instead of having a single knob attached, tens of hundreds of these knobs may be seen as little dots hanging from the inner surface into the fluid of the cavity. Each of these dots can evert itself, or push its head out, and will then be seen by the aid of a glass to be a perfectly developed head having four suckers and a crown of about twenty-eight hooks. These heads, when the cysts are fed to dogs, may develop into as many individuals. Most of them will gen-

erally die, and only a few of the stronger will develop. Instead of the single worm which the embryo of the *Taenia marginata* produces, this peculiar species develops many from each of its embryos. In this there is a compensation; for while many of the *Taenia marginata* embryos come to maturity, but one or two of the coenuri survive, and thus the opportunities for the further perpetuation of the species are diminished.

Duration of Development.—Experiments have shown that the embryo may be found in the brain from two to three weeks after feeding, and is then about the size of a mustard seed. Between three and six weeks after feeding, the worst symptoms of the disease occur. The coenurus becomes developed in from two to three months. After this time it continues to grow in size and in the number of heads from six to eight months, when it usually causes the destruction of the affected sheep. When the developed coenurus is fed to a dog, it usually produces adult tape-worms within a month.

In the migrations of these parasites many are lost and destroyed. Of the hundreds of eggs which leave the intestines of dogs, few reach the stomach of the sheep, and of these still fewer enter the cranium. Of the few which become adult—one or two in each sheep affected—but a small percentage nowadays arrive in the dog again. Thus of the thousands of embryos that left the dog, but a single coenurus may return. But this coenurus, developing again into several tape-worms, is the source of many new embryos for the re-infection of the sheep.

Disease.—Lambs and yearling sheep seem to be the most liable to infection; those over two years old seem to possess a degree of immunity. Sheep herded by dogs; those breeds which eat the grass close to the grounds; sheep which drink out of ponds or brooks in which the dogs bathe; flocks belonging to careless flock-masters, who leave the skulls and viscera of slaughtered and dead sheep strewn through the pastures, are more liable than others. In short, any of the conditions which help the distribution of the parasites, render sheep more subject to the disease.

Symptoms and Progress.—The symptoms of gid in sheep are dependent upon the stage of invasion and development at which the parasite has arrived. The invasion embraces the period from the time that the embryos have been swallowed to the time that they become partially developed in the brain. The stage of invasion generally passes unnoticed. Between the second and third week those animals worst infected—for but few of those infected show signs of disease in this stage—show symptoms of inflammation of the brain and surrounding tissues. It is at this period that the little parasites are active in progressing through the tissues. Dullness, feebleness, heat in the head, intense redness of the mucous membrane of the eyes, and increased puls-beat are characteristic of this stage. The head is generally held in a peculiar position, either stretched at length, turned backward, inclined to either side, or drooped. The intensity of these symptoms depends upon the number of invading parasites. Later, spasmodic convulsion or paralysis may occur. Death may take place in about six or eight days after the first symptoms are noticed. The diagnosis at this stage is difficult, but depends on finding the parasites and their channels on the surface of the brain. The former are at this time of the size of a mustard or flax-seed. A correct diagnosis at this stage will influence the future treatment of the flocks. If the sheep live through this stage, no

further symptoms will be noticed for from four to six months, when a new set of symptoms will appear. It is said that of all infected sheep, less than two per cent of those which show the disease in the early stage, recover.

The symptoms of the second stage arise from two causes—from the irritation produced by the little heads thrust out of the mother bladder, and from the disturbances created by the pressure caused by the increase in size of the coenurus.

The actions from which the disease has derived its common name in all countries are especially characteristic. The head turns; the animal walks in a circle; it staggers, trembles, has convulsions, acts stupid; it becomes unable to eat or drink, and finally dies of exhaustion or paralysis. The various gaits and peculiar positions assumed by the infected animals arise from the particular location of the parasite. The length of time between the attack and death also depends on this position, some parts of the brain being more vital than others. Death occurs within a month or a month and a half after the secondary symptoms appear.

A diagnosis of the disease in this stage can be determined by an examination of the infected animal. Sometimes at this stage the parasite softens the wall of the skull by its continued pressure and the spot can be felt with the fingers. Coenuri in the spinal canal are more difficult to diagnose. They cause the sheep to stagger and walk peculiarly with the posterior extremities. Sometimes the disease is manifested by an intense itching along the backbone, without any apparent reason. Paralysis of the hind limbs and of the rectum and bladder often result.

The gid should not be confounded with the disease caused by grubs in the nasal cavities, which sometimes produce similar symptoms. The false gid produced by the larvae of the *Estrus ovis* will cause more symptoms of a catarrh or cold in the head, and less of the turning, which is so very characteristic of true gid.

Treatment.—There is no treatment that can be profitably followed for sheep thus affected. A veterinarian could, in the more advanced cases, locate the position of the cyst either by inference from the character of the symptoms or by feeling the softened spot in the cranium. He might by carefully cutting away, or trephining the skull over the point, remove the parasite and enable the sheep to recover. The intelligent farmer might learn to do this himself, but after it is all done, the cost of doing it will about equal the value of the sheep saved. The true treatment, and that which has saved France and Germany more than any medical or surgical treatment devised, consists in prevention.

Prevention lies in the treatment of the sheep and of the dogs. As the developed coenurus comes only from the cranium or spinal canal, it is very easy to prevent dogs from being infected by taking care that they cannot get these portions of the carcass, either when the sheep are slaughtered, or after they have died in the pasture or sheep-cote. The heads should either be rendered, burned, or deeply buried, and not thrown into the first convenient corner.

When the skulls and viscera must be fed to dogs, they should be subjected to a prolonged boiling. The soup so made would be harmless. When the lambs are known to have passed through the first stage of the disease and

are fat enough for sale, at the very beginning of the secondary symptoms they should be slaughtered and marketed, care being taken with the first killed to verify the diagnosis. This will save more than any other proceeding.

All sheep men should at least twice annually, treat all dogs in the following manner:

First—Dogs should be confined so that all discharge may be collected and burned after treatment; should then be starved for twenty-four hours; then administer from one to two drams of powdered areca nut; two hours subsequently administering from one to two ounces of castor oil. After the oil has thoroughly operated, collect all the discharge and burn. Again repeat the treatment in not less than six months.

For the information of all sheepmen and to show how deep-rooted the dog tapeworm menace has become we append herewith a copy of the proclamation of the Secretary of Agriculture, Hon. James Wilson, upon this subject:

UNITED STATES DEPARTMENT OF AGRICULTURE.
BUREAU OF ANIMAL INDUSTRY.

Order Providing for the Inspection and Quarantine of Collie, Shepherd, or Sheep Dogs Imported Into the United States, or the Territories Thereof, From Any Country of the World Except North America.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF ANIMAL INDUSTRY,
Washington, D. C., November 25, 1910.

The fact has been determined by the Secretary of Agriculture that collie, shepherd, or sheep dogs are subject to the infection of tapeworm (*Taenia coenurus*), the infective element causing gid, sturdy, or staggers in sheep, through the invasion of the brain and spinal canal of these animals by the cystic form of this parasite (*Coenurus cerebralis*):

Now, therefore, I, James Wilson, under authority conferred by section 2 of the act of congress approved February 2, 1903 (33 Stat., 791), do hereby order, and notice is hereby given to the owners, officers, and agents of all steamers and other vessels of all descriptions, plying between any foreign country, except the countries of North America, and the United States or the territories thereof, and to all stockmen and all other persons concerned in any way or manner in the importation of, or traffic in, collies, shepherd, or sheep dogs, that all such dogs entering the United States or the Territories thereof shall be subjected to quarantine for a period not to exceed two weeks, or until it can be determined by inspection or examination by an inspector of the Bureau of Animal Industry, as to whether such dogs are the hosts of *Taenia Coenurus*. In the event it is found by such inspection or examination that such animals are so infected, they must be medically treated under the supervision of an inspector of the Bureau of Animal Industry and held in quarantine until it can be definitely determined that they are free from such infection

before being allowed to be imported into the United States or to mingle with sheep or other livestock in the United States.

The ports of entry for such dogs are limited to the ports designated in the regulations of this department for the entry of animals which are subject to both inspection and quarantine, viz.: On the Atlantic seaboard, Boston, Mass.; New York, N. Y.; and Baltimore, Md. On the Pacific seaboard, San Francisco and San Diego, Cal., and Port Townsend, Wash.

This order will take effect immediately and will continue in force until otherwise ordered.

JAMES WILSON,
Secretary of Agriculture.

This commission most heartily endorses the action of its committee and its recommendations upon the sanitary measures referred to and calls upon and asks the hearty co-operation of every sheepman in the state to see to it that the recommendations are heartily concurred in.

All inspectors and employes of this department will be instructed to see to it that these recommendations are acted upon, and that the quarantine notice of the Secretary of Agriculture is strictly complied with.

MATERIAL TO CONSTRUCT VAT.

Rough lumber—

1400 ft. 1 x 12 x 16.

14 pieces 2 x 6 x 12.

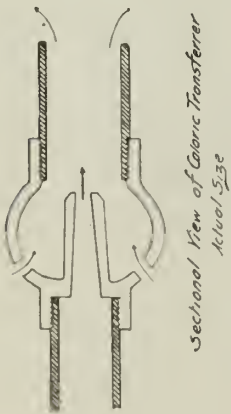
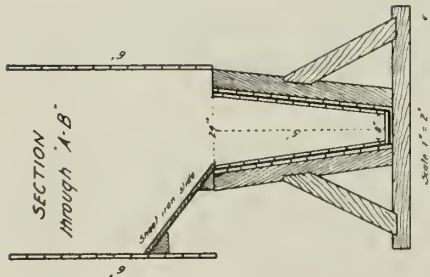
16 pieces 2 x 6 x 10.

2 rolls tar paper.

To build a plant of this kind, first dig a trench three feet wide at top and two feet at bottom and three and one-half feet deep, see that trench is level on bottom, then place ribs two feet apart, use 2 x 6 for ribs, sheet up with 1 x 12, place bottom board first, next put tar paper in, lap four inches, then put last layer of board on, this will make a vat that will last for years if it is kept full of water.

The draining pen is built the same way, by first placing sills, giving a slope of six inches from each side to center of the pen and eight inches slope toward the vat. Start in the center of draining pen to lay floor, then layer of tar paper; starting at the vat lay tar paper to the back of the pen, lap about six inches. Lay the boards lengthwise and paper crosswise, put second layer of boards, break joints in building vat and draining pen. The chute leading to the vat is built on an incline of about a foot higher than the vat and on the side of the vat. This will give you a slide into the vat from the side which is a great deal better than from the end. The slide should be faced with sheet iron. Sides of the chute about three and one-half feet high and should be solid, boarded up with flooring.

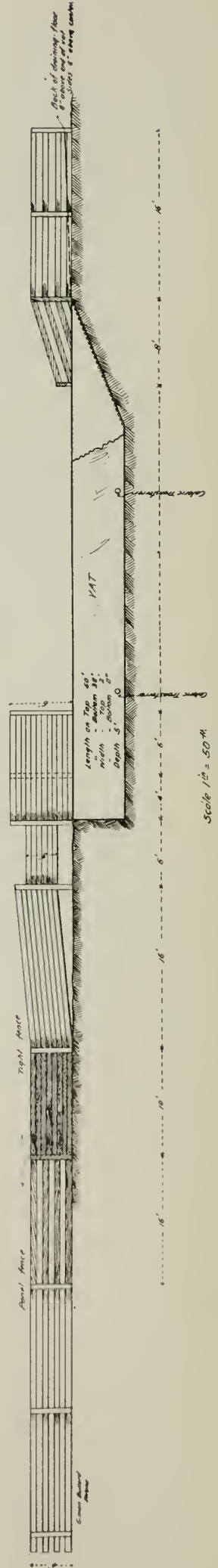
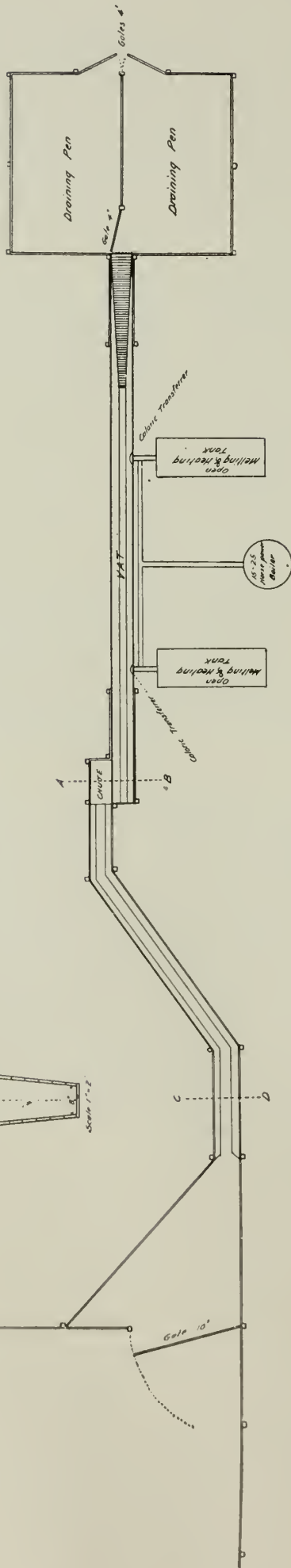
Montana Sheep Commission Dipping Vat.



SECTION through C-D



Corral 90' x 90'



LIST OF SHEEP COMMISSIONERS 1911-1912

County.	Name.	Address.
Beaverhead.....	W. J. Crowell.....	Dell
Blaine.....		
Broadwater.....	J. D. Doggett.....	Johnson
Carbon.....	L. C. Piper.....	Absarokee
Cascade.....	Roy Clary.....	Great Falls
Chouteau.....	A. S. Lohman.....	Chinook
Custer.....	F. D. O'Neill.....	Miles City
Dawson.....	E. S. Herrick.....	Glendive
Deer Lodge.....		
Fergus.....		
Gallatin.....		
Granite.....	S. L. Walker.....	Philipsburg
Hill.....		
Jefferson.....	E. J. Stanley.....	Whitehall
Lewis and Clark.....	F. D. Miracle.....	Helena
Musselshell.....		
Madison.....	Frank Schwartz.....	Blaine
Meagher.....		
Park.....	J. M. Darroch.....	Livingston
Powell.....		
Ravalli.....	P. J. Shannon.....	Hamilton
Rosebud.....	John Davidson.....	Lee
Silver Bow.....	Jerry J. Flannagan.....	Butte
Sweet Grass.....	Harvey Coit.....	Big Timber
Teton.....	G. M. Coffee.....	Bynum
Valley.....	Alex. Elliott.....	Malta
Yellowstone.....	Thos. Snidow.....	Billings

No appointments were made for Flathead, Lincoln, Missoula, and Sanders Counties—Few if any sheep in these counties.

LIST OF SHEEP INSPECTORS

County.	Name.	Address.
Beaverhead.....	Dr. W. G. Orr.....	Dillon
	Dr. A. C. Morrow.....	Dillon
Blaine.....	Z. C. Boyd.....	Chinook
Broadwater.....	Jeff Doggett.....	Johnson
Carbon.....	John Flanagan.....	Absarokee
Cascade.....	Dr. L. A. Nutting.....	Great Falls
Chouteau.....	Dr. Z. C. Boyd.....	Chinook
Custer.....	Dan H. Bowman.....	Miles City
	Dr. A. H. Cheney, Special.....	Miles City
	R. Turbiville, Special.....	Midland
	R. A. Selway, Special.....	Alzada
	W. S. Snell, Special.....	Miles City
Dawson.....	Dr. A. J. Dufrene.....	Glendive
Deer Lodge.....		
Fergus.....	D. L. P. Sharp.....	Moore
Flathead.....	Dr. C. F. Leslie.....	Kalispell
Gallatin.....	Dr. Howard Welch.....	Bozeman
Granite.....		
Jefferson.....	E. J. Stanley.....	Whitehall
Lewis and Clark.....	Dr. E. D. Nash.....	Helena
Lincoln.....		
Madison.....	F. J. Schwartz.....	Blaine
Meagher.....	C. W. Cook.....	Unity
Missoula.....	Dr. J. R. Ward.....	Missoula
Park.....	Dr. A. D. Knowles.....	Livingston
Powell.....	William Williams.....	Deer Lodge
Ravalli.....	Albert May.....	Stevensville
Rosebud.....	Andrew P. Tadsen.....	Forsyth
Sanders.....		
Silver Bow.....		
Sweet Grass.....	Glen M. Parker.....	Big Timber
Teton.....	Dr. F. T. Hall.....	Conrad
Valley.....		
Yellowstone.....	Dr. G. E. Thomas.....	Billings

